

## Evaluation of the fundamental technical aspects of the game in Six Nations Rugby

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### Abstract

**Background:** The Six Nations represents the oldest and most famous rugby tournament in the world. The several types running, of technical and of tactical in the team sports such as rugby, basketball, and soccer, vary according to physical characteristics and sports. In particular, in the rugby the running is characterized by continuous acceleration and deceleration phases, which entail a greater physical and mental commitment. **Aim:** The aim of this study has been of analyzed and comparison, through the video analysis, the quality of the play of the six rugby teams that participated at tournament of the Six Nations 2018 and the impact that these aspects had on the final result. **Methods:** The data sample is represented by the matches played and from the technical variables detected the video analysis of the matches examined. **Results:** The findings of this study offer valuable insights for coaches aiming to optimize training and tailor the training load based on both gender and young players. This optimization pertains to the development of coordination and conditioning skills, as well as the technical and tactical experiences of the players. Therefore, it is imperative to assess and continually monitor training, incorporating tools such as video analysis and GPS, to analyze technical and tactical aspects. This approach is a crucial element in performance control. **Conclusions:** The Irish national team managed to emerge thanks to the high number of passes made, a remarkable technical precision and a superior team organization of the team which allowed them to reach 26% of the goals in the tournament, underscoring that the effectiveness of ball movement in isolation does not ensure victory.

**Key Words:** Video analysis, passes, kicks placed, performance.

### Introduction

In rugby, a sport characterized by rigorous physical demands and strategic complexities, every player, regardless of physique or size, assumes a crucial role (Till et al., 2017). A rugby team consists of 15 players, each designated with a jersey number that represents their specific responsibilities on the field. Regardless of the number on their jerseys, all players must collaborate to achieve a shared objective: scoring points and crossing the opponent's goal line (D'Isanto, 2019). Within this team dynamic, each rugby player must possess a set of essential skills, including problem-solving abilities, finesse to outmaneuver opponents, and proficiency in facing challenges. This sport encompasses executing precise passes, making strategic kicks, effectively offloading the ball, and skillfully recovering it (Sauliere et al., 2019).

To master these fundamental rugby skills, a solid foundation of motor learning is essential (Raiola, 2015; Raiola & Di Tore, 2017; Raiola, 2017). In addition, to compete at various levels, from grassroots to elite, athletes must hone not only their rugby-specific talents, but also cultivate broader skills that transcend the boundaries of the sport (Raiola, 2014).

These diverse demands are influenced by factors such as the level of competition (Twist et al., 2014), playing level (Hausler et al., 2016), and the position each player assumes on the field (Waldron et al., 2011). The dynamic nature of rugby typically involves alternating phases of low-intensity activities, such as walking or jogging, punctuated by bursts of high-intensity exertion, encompassing rapid accelerations, abrupt decelerations, full-speed sprints, and skillful running (Delaney et al., 2016; Dempsey et al., 2018).

In the modern era of Rugby League, the sport's highest levels place formidable demands on the motor qualities and functional capabilities of athletes (Di Domenico et al., 2019). The motor activity of rugby players is distinguished by a rich tapestry of movements, each varying in character, complexity, and structural intricacy, encompassing individual actions, group dynamics, and team cohesion. These movements transpire in ever-evolving and often unpredictable game situations (Altavilla, 2019; 2020).

Such dynamism necessitates a meticulously crafted and purpose-driven training regimen (D'Elia, 2019; D'Isanto et al., 2022d), designed to enhance the physical attributes of rugby players, including strength, speed, endurance, coordination abilities, and flexibility (Pasko, 2014). Furthermore, rugby's challenges extend beyond the physical realm, involving intricate technical and tactical elements that unfold on the field (D'Isanto et al.,

2022a; D’Isanto et al., 2022b; D’Isanto et al., 2022c). These elements are executed with precision and intensity (Tsos, et al., 2018), further emphasizing the multidimensional nature of the sport. It’s important to note that the responsibility of mastering these skills and tactics doesn’t solely rest on the shoulders of the coach; the athletes themselves must possess an intimate understanding of their own bodies and movements to deliver their best performances on the field (D’Elia, 2020; Raiola, 2013).

In rugby, research has traditionally focused on describing game patterns (Eaves and Hughes, 2003; Eaves et al., 2005), work ratios (Deutsch et al., 2007; Duthie et al., 2003, 2005), and performance indicators (James et al., 2005; Jones et al., 2004; Prim et al., 2006). Some studies link these aspects to game results, like Hunter and O’Donoghue (2001), who found differences favoring winning teams in variables such as invading the rival’s 22-meter zone frequency and points scored during these invasions. Similarly, Hughes and White (2001) noted that forwards in winning teams are more effective in line-outs and scrummages. Other studies by Jones et al., 2004, and James et al. (2005) explored differences between winning and losing teams, focusing on individual team performances in specific matchups.

Results show winning teams excel in scoring points during field invasions (Hunter and O’Donoghue, 2001), line-outs (Hughes and White, 2001; Jones et al., 2004), play continuity, ball retention, and efficient kicking (Stanhope and Hughes, 1997).

Despite limitations in using different variables across studies (Hughes et al., 2002), analyzing game statistics for individual and collective skills remains a valuable tool for describing and monitoring competition behavior, providing insights into the intricacies of the game.

The primary objective of this study was to investigate the quality of play among the six rugby teams participating in the 2018 Six Nations (Ireland, Wales, Scotland, France, England, and Italy). The study employed video analysis to assess the impact of various factors, including passes, conversions, well-placed kicks, ball retention, and the distance covered during the game, on the final results and the overall performance of these teams. By scrutinizing these aspects, the study aimed to provide insights into the dynamics of rugby gameplay and its influence on the outcome of competitive matches.

**Material & methods**

*Participants*

The data sample is represented by the matches played by six teams examined. The data for the statistical analysis, and therefore for the calculation of the averages and of the percentages, were extrapolated from the video analysis of the matches examined and compared. The analysis was conducted on the games played by the teams present at the Six Nations rugby tournament 2018: Ireland, Wales, Scotland, France, England and Italy.

*Procedures*

In each match, a meticulous data collection process encompassed variables such as the number of passes made, transformed kicks, placed kicks, drop kicks, and meters gained during the game. These variables were systematically analyzed. To present the results in a structured and comprehensible manner, two tables, designated as Table 1 and Table 2, were employed for enhanced data analysis and visualization.

**Results**

**Table 1.** Game analysis of the teams.

Variable	IRELAND		WALES		SCOTLAND		FRENCH		ENGLAND		ITALY	
	Values	%	Values	%	Value s	%	Values	%	Values	%	Value s	%
Passes	1038	19.5	832	15.7	907	17.1	777	14.6	980	18.5	774	14.5
Processed kicks	18	30	12	20	8	13.3	6	10	7	11.7	9	15
Kicks placed	7	13	10	18.5	10	18.5	17	31.5	6	11.1	4	7.4
Drop	1	50	0	0	0	0	1	50	0	0	0	0
Meters earned	2241	18.3	2188	17.8	2014	16.4	1962	16	2070	16.9	1778	14.5

**Fig.1.** Percentage values of the analyzed variables.

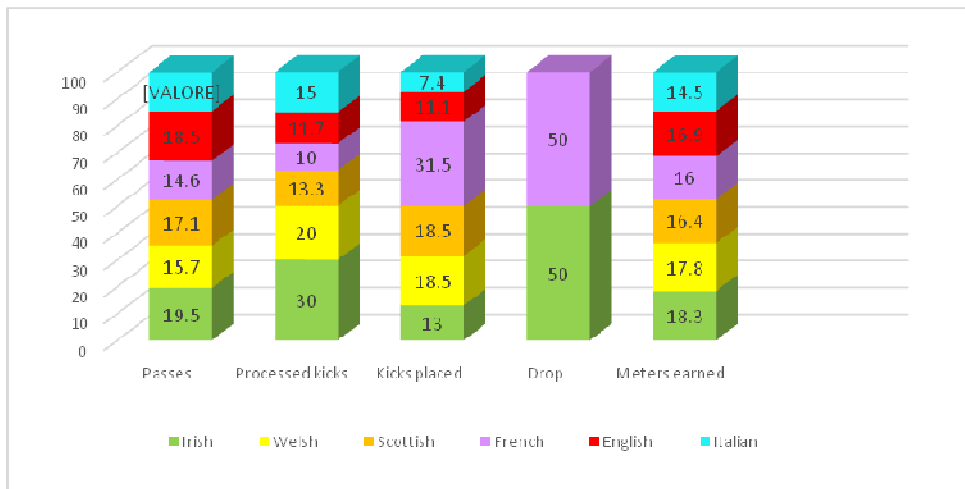
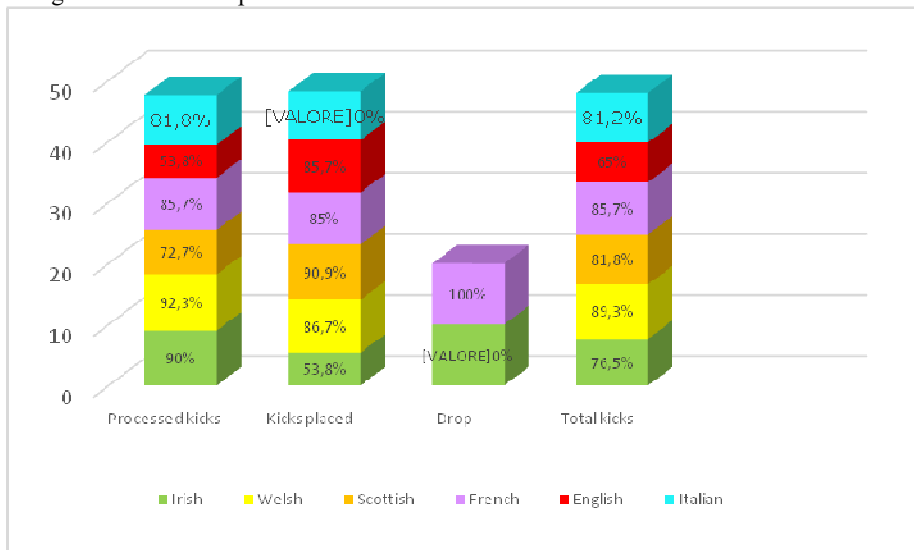


Table 2. Attempts made and success rate.

Variables	IRELAND		WALES		SCOTLAND		FRENCH		ENGLAND		ITALY	
	R/T	%	R/T	%	R/T	%	R/T	%	R/T	%	R/T	%
Goals	20		13		10		8		14		12	
Processed kicks	18/20	90	12/13	92,3	8/11	72,7	6/7	85,7	7/13	53,8	9/11	81,8
Kicks placed	7/13	53,8	13/19	86,7	10/11	90,9	17/20	85	6/7	85,7	4/5	80
Drop	1/1	100	0	0	0	0	1/1	100	0	0	0	0
Total kicks	26/34	76,5	25/28	89,3	18/22	81,8	24/28	85,7	13/20	65	13/16	81,2

Fig.2. Percentage values on attempts made and success rate



**Discussion**

Ireland, the winner of the 2018 Six Nations tournament, displayed a formidable team with no apparent weaknesses. They excelled in defense, demonstrated meticulous organization, maintained a cohesive scrum, and were adept at both close-quarter battles and open-field play. When scrutinizing their performance, it's evident that Ireland outperformed other teams in several key areas. They led in terms of passes completed, transformations made, ground gained during matches, and ranked third in successful kicks (as shown in Table 1).

Examining their conversion attempts and success rates, Ireland emerged as the team with the most goals scored and was second in the category of conversion errors. Surprisingly, they ranked fifth among the six teams for overall errors (including placed kicks, transformations, and mistakes). This suggests that the individual

players on the Irish national team possessed a higher level of rugby skills and demonstrated exceptional quality in their motor skills (as shown in Table 2).

The Welsh national team secured the fourth position for the number of passes made during the tournament. They were second in transformations, kicks placed, and ground gained, as reflected in Table 1. When analyzing their conversion attempts and success rate, Wales stood as the third-best team in terms of goals achieved. They made the fewest conversion errors, ranked second for the fewest overall mistakes, and were the most accurate in all types of kicks (as shown in Table 2).

Turning our attention to the Scottish national team, they ranked third in passes made, fourth in transformations, second in kicks placed, and led in ground gained (as indicated in Table 1). However, their performance in terms of goal-scoring was subpar, surpassed only by France. Scotland excelled in conversion accuracy, made fewer mistakes in placed kicks, and were the third-best team in terms of overall errors, as revealed in Table 2.

The French national team was fifth in the number of passes, ranked last in transformations, and was the most successful in kicks placed. However, they struggled to gain ground, a problem shared with the Italian team (as displayed in Table 1). Analyzing their conversion attempts and success rates, France had the fewest goals in the tournament, ranked third for the fewest transformation errors, fourth for the fewest overall errors, attempted and scored drop goals (shared with Ireland), and were second in the category of making the fewest mistakes in total (as highlighted in Table 2).

Moving on to the English national team, they were one of the teams with the most passes (second only to Ireland), second to last in transformations, fourth in kicks placed, and third in ground gained (according to Table 1). In terms of goal-scoring, England was second only to Ireland but struggled with the highest number of conversion errors. They ranked third for placed-kick mistakes and were the least successful in all types of kicks, as presented in Table 2.

Finally, the Italian team completed the fewest passes among all participating teams, ranked third in transformations, was last in kicks placed, and struggled to gain ground (as shown in Table 1). In terms of goal-scoring, Italy placed fourth, ranked fourth for transformation errors, made the most errors overall in terms of placed kicks (second only to Ireland), and was fourth in the category of success for all kick attempts (as outlined in Table 2).

To sum up, Ireland, the team with the most passes, demonstrated exceptional performance by scoring the most goals, while Wales excelled in conversion accuracy. Scotland had a strong midfield but struggled in physical battles. France was less successful in passes but efficient in kicks, and England had a high goal-scoring rate but struggled with conversion accuracy. Italy faced challenges in finalizing their actions and made numerous mistakes during the game, ranking last in many aspects.

## Conclusions

The results of this study highlight the complexity inherent in a team's success, underscoring that the effectiveness of ball movement in isolation does not ensure victory. Despite accumulating a surplus of passes, England's failure to secure the title underscores the critical importance of team organization and midfield coordination. This research sheds light on the contrasting performance of the Irish national team, attributing their success to a combination of extensive passing, exceptional technical precision, and superior team organization, culminating in an impressive 26% goal contribution to the tournament. The theoretical significance of this study lies in its exploration of variables such as passing, technical precision, and team organization, contributing to a deeper understanding of the multifaceted dynamics influencing team performance. These insights have tangible implications for tactical strategies, compelling teams to prioritize not just swift ball movement but also, to emphasize cohesive midfield play and enhance the overall team structure. A potential limitation regarding the scope of matches analyzed has been recognized, prompting calls for broader surveys that include different teams and leagues. Future research could delve into the specific impact of each analyzed variable on team performance, providing a more nuanced understanding of their individual contributions.

## References

- Altavilla, G. (2019). Monitoring training to adequate the teaching method in training: An interpretative concept. *Journal of Physical Education and Sport*, 19, 258, 1763-1766.
- Altavilla, G. (2020). Energetic cost in the different running conditions in team sport or the educational teaching method. *Sport Science*, 14, 17-20.
- Delaney, J., Thornton, H., Duthie, G., & Dascombe, B. (2016). Factors that influence running intensity in interchange players in professional rugby league. *International Journal of Sports Physiology and Performance*, 11(8), 1047-1052.
- D'Elia, F. (2019). School and sport: The high-level student-athletes in Italy. *Journal of Human Sport and Exercise*, 14 (Proc5), S2031-S2036. <https://doi.org/10.14198/jhse.2019.14.Proc5.25>

- D'Elia, F. (2020). Teachers' perspectives about contents and learning aim of physical education in Italian primary school. *Journal of Human Sport and Exercise*, 15 (Proc2), S279-S288. <https://doi.org/10.14198/jhse.2020.15.Proc2.19>
- Dempsey, G., Gibson, N., Sykes, D., Prymachuk, B., & Turner, A. (2018). Match demands of senior and junior players during international rugby league. *Journal of Strength and Conditioning Research*, 32(6), 1678–1684.
- Deutsch M.U., Kearney G.A., Rehrer N.J. (2007). Time - motion analysis of professional rugby union players during match-play. *Journal of Sports Sciences*, 25(4), 461-467.
- Duthie G., Pyne D., Hooper S. (2003). Applied physiology and game analysis of rugby union. *Sports Medicine*, 33(13), 973-991. <https://doi.org/10.2165/00007256-200333130-00003>
- Duthie G., Pyne D., Hooper S. (2005). Time motion analysis of 2001 and 2002 super 12 rugby. *Journal of Sports Sciences*, 23(5), 523-530. <https://doi.org/10.1080/02640410410001730188>
- D'Isanto, T. (2019). Effectiveness and influence of some technical fundamentals on the game's quality in football. *Journal of Human Sport and Exercise*, 14 (Proc5), S2026-S2030. <https://doi.org/10.14198/jhse.2019.14.Proc5.24>
- D'Isanto, T., Aliberti, S., Altavilla, G., Esposito, G., & D'Elia, F. (2022a). Heuristic Learning as a Method for Improving Students' Teamwork Skills in Physical Education. *International Journal of Environmental Research and Public Health*, 19(19),1-9. <https://doi.org/10.3390/ijerph191912596>
- D'Isanto, T., Altavilla, G., Esposito, G., D'Elia, F., & Raiola, G. Heuristic Learning and Sport: Theoretical Lines and Operational Proposals (2022b). *Encyclopaideia*, 26 (64), 69-80. <https://doi.org/10.6092/issn.1825-8670/14237>
- D'Isanto, T., Di Domenico, F., Aliberti, S., D'Elia, F., & Raiola, G. (2022c). Criticisms and perspectives of heuristic learning in physical education. *Pedagogy of Physical Culture and Sports*, 26 (2), 93-100. <https://doi.org/10.15561/26649837.2022.0203>
- D'Isanto, T., Di Domenico, F., Sannicandro, I., & D'Elia, F. (2022d). Improvement of Qualitative and Quantitative Aspects of the Sports Performance of Young Players Through High Intensity Interval Training. *Teoria ta Metodika Fizicnogo Vihovanna*, 1, 70-75. <https://doi.org/10.17309/tmfv.2022.1.10>
- D'Isanto, T., D'Elia, F., Raiola, G., & Altavilla, G. (2019). Assessment of sport performance: Theoretical aspects and practical indications. *Sport Mont*, 17(1), 79-82. <https://doi.org/10.26773/smj.190214>
- Eaves J., Hughes D., Lamb L. (2005). The consequences of the introduction of professional playing status on game action variables in international northern hemisphere rugby union football. *International Journal of Performance Analysis in Sport*, 5(2), 58-86. <https://doi.org/10.1080/24748668.2005.11868328>
- Eaves S., Hughes M.D. (2003). Patterns of play of international rugby union teams before and after the introduction of professional status. *International Journal of Performance Analysis in Sport*, 3(2), 103-111. <https://doi.org/10.1080/24748668.2003.11868281>
- Hausler, J., Halaki, M., & Orr, R. (2016). Application of Global Positioning System and microsensor technology in competitive rugby league match-play: a systematic review and meta-analysis. *Sports Medicine*, 46(4), 559–588. <https://doi.org/10.1007/s40279-015-0440-6>
- Hughes M.D., White P. (2001). *An analysis of forward play in the 1999 rugby union World Cup for men. Books of abstracts Fifth World Congress of Performance Analysis in Sports*. Cardiff: UWIC; Hughes M.D., Franks I.183-191.
- Hunter P., O'Donoghue P. (2001). A match Analysis of the 1999 Rugby Union World Cup. *Books of abstracts Fifth World Congress of performance analysis in sports*. Cardiff: UWIC; Hughes M.D., Franks I. 85-90
- James N., Mellalieu S.D., Jones N.M.P. (2005). The development of position-specific performance indicators in professional rugby union. *Journal of Sports Sciences*, 23(1), 63-72. <https://doi.org/10.1080/02640410410001730106>
- Jones N.M.P., Mellelieu S.D., James N. (2004). Team performance indicators as a function of winning and losing in rugby union. *International Journal of Performance Analysis in Sports*, 4(1), 61-71. <https://doi.org/10.1080/24748668.2004.11868292>
- Jones N., James N., Mellalieu S.D. (2008). An objective method for depicting team performance in elite professional rugby union. *Journal of Sports Sciences*, 26(7), 691-700. <https://doi.org/10.1080/02640410701815170>
- Pasko, V. (2014). Perfection of educational-training process on the basis of account of parameters special physical preparedness of rugby-players. *Physical education of students*, 3, 49-56.
- Prim S., van Royen M., Lambert M. (2006). A comparison of performance indicators between the four South African teams and the winners of the 2005 Super 12 Rugby competition. What separates top from bottom?. *International Journal of Performance Analysis in Sport*, 6(2), 126-133. <https://doi.org/10.1080/24748668.2006.11868378>
- Raiola, G. (2013). Body knowledge and motor skills. *Knowledge Cultures*, 1 (6), 64-72.
- Raiola, G. (2014). Motor control and learning skills according to cognitive and ecological dynamic approach in a vision on behaviorism, cognitive, Gestalt and phenomenology theories. *Mediterranean Journal of Social Sciences*, 5 (15), 504-506.

- Raiola, G. (2015). Sport skills and mental health. *Journal of Human Sport and Exercise*, 10, S369-S376.
- Raiola, G., & Di Tore, P.A. (2017). Motor learning in sports science: different theoretical frameworks for different teaching methods. *Sport Science*, 10, 50-56.
- Raiola, G. (2017). Motor learning and teaching method. *Journal of Physical Education and Sport*, 17, 2239-2243. <https://doi.org/10.7752/jpes.2017.s5236>
- Raiola, G., Di Domenico, F. (2021). Approaches to motor learning: Cognitive approach versus ecological dynamic one. *Journal of Human Sport and Exercise*, 16 (3), S1491-S1505.
- Saulière G, Dedecker J, Moussa I, Schipman J, Toussaint JF, & Sedeaud A. (2019). Quantifying collective performance in rugby. *Frontiers in Sports and Active Living*, 11(1), 44. <https://doi.org/10.3389/fspor.2019.00044>
- Standhope J., Hughes M.D. (1997). *An analysis of scoring in the 1991 rugby union world cup. Notational Analysis of Sports III*. Cardiff: UWIC; Hughes M.D., Franks I. 58-74
- Till, K., Scantlebury, S., & Jones, B. (2017). Anthropometric and Physical Qualities of Elite Male Youth Rugby League Players. *Sports Medicine*, 47(11), 2171-2186. <https://doi.org/10.1007/s40279-017-0745-8>.
- Tsos, A., Pasko, V., Rovniy, A., Nesen, O., Pomeshchikova, I., & Mukha, V. (2018). The improvement of the technical preparedness of 16–18-year-old rugby players with the use of the computer program “Rugby-13”. *Physical Activity Review*, 6, 257-265. <http://dx.doi.org/10.16926/par.2018.06.30>
- Twist, C., Highton, J., Waldron, M., Edwards, E., Austin, D., & Gabbett, T. (2014). Movement demands of elite rugby league players during Australian National Rugby League and European Super League matches. *International Journal of Sports Physiology and Performance*, 9(6), 925–930. <https://doi.org/10.1123/ijspp.2013-0270>
- Waldron, M., Twist, C., Highton, J., Worsfold, P., & Daniels, M. (2011). Movement and physiological match demands of elite rugby league using portable global positioning systems. *Journal of Sports Sciences*, 29(11), 1223–1230. <https://doi.org/10.1080/02640414.2011.587445>